

change material." However, claim 1 recites "a device. . .and a heat-absorbing unit which contains a phase change material. . .". Moreover, with respect to "the heat conducting unit" in that claim, it is recited that the "device" is one "comprising a heat conducting unit." Thus, antecedent basis for this term is also clearly provided.

With respect to claim 6, dependent upon claim 1, since claim 1 recites "a" phase change material, the recitation of "the" phase change material in claim 6 also finds proper antecedent basis in the claim upon which it depends. The same is true for claims 7 and 8 with respect to the term "the heat conducting unit."

With respect to claim 9, this claim recites a component (Z) "comprising. . .a heat-generating electronic component" (emphasis added); as noted above, "the heat conducting unit" can be found in claim 1, providing antecedent basis for this dependent claim recitation.

With respect to claim 10, antecedent basis for the "electronic component" is found in claim 9 which recites "a" heat-generating electronic component; support for component (Z) is found in the preamble of claim 9 which recites "a" component (Z). Component (Z) thus has proper antecedent basis in claim 9, for claim 10 as well as claim 11, objected to at the top of page 5 of the Office Action.

Finally, with respect to claims 14-16, these claims recite a device "comprising *a* heat sink" (emphasis added) and, thus, clearly do not need antecedent basis for the term "heat sink." Similarly, the "heat absorbing means" or "heat absorbing component," recited with the article "A", do not need antecedent basis for the recitation. Withdrawal of all these rejections is appropriate and is therefore requested.

Rejections Under 35 U.S.C. §102

Claims 1, 6-9 and 14-16 have been rejected under 35 U.S.C. §102(b) over Laing '356.

Reconsideration of this rejection is respectfully requested.

It is argued, at page 5 of the Office Action, that Laing discloses a device comprising a heat conducting unit and heat absorbing unit with a phase change material "wherein the phase change material is arranged in such a way that heat flow from the electrical or electronic component to the heat conducting unit is not interrupted and a significant heat flow to the phase change material only occur if the temperature of the heat conducting unit exceeds phase change temperature of the phase change material" (numeral references omitted). This "argument" is, in fact, a quotation from *Applicants' claim*. The portion of the reference cited in the Office Action, Fig. 1, in col. 2, lines 35-70, do not disclose such an arrangement of components.

As discussed in the present specification, for example at page 5, lines 13-16, the phase control material in the present claims is arranged in a way such that significant flow of heat thereto only occurs if the heat absorbing component (e.g., a heat sink) exceeds the phase change temperature of the phase change material. Thus, typically, the heat is dissipated by the heat absorbing means, for example, cooling fins as a heat sink, and the heat does not become absorbed by the phase change material unless there is a build up of heat that the heat absorbing unit cannot dissipate. In the reference, for example as most clearly shown in Fig. 1, a diode (1) is in contact with two vessels (3) containing heat absorbing phase-change material (6). The heat is absorbed by the phase change material, when the heat of the diode reaches such a point that it is at optimum operating temperature. See, for example, col. 2, line 62 to col. 3, line 5. As is evident from Fig. 1, the cooling fins serve to dissipate the heat of the phase change material, and thus, receive heat only once the phase change material has itself been heated. This clearly does not comport with the definition of "not interrupted" in the present specification. For example, see page 5, lines 5-8 indicating that "an interruption . . . exists if the PCM, going to the design of the heat sink, firstly has to absorb the heat before the heat

can be dissipated via the cooling fins." This is clearly situation in Laing, and, thus, Laing cannot anticipate the present claims.

Accordingly, it is submitted that the cited reference does not disclose each and every element of the claims, and withdrawal of this rejection is respectfully requested.

Moreover, it would not have been obvious to modify the arrangement disclosed in the reference, in order to arrive at a configuration such as that presently claimed, inasmuch as such modification would render the reference device unsuitable for its stated purpose. Laing indicates, for example, at col. 2, lines 62-end that the placement of the PCM next to the semiconductor results in the semiconductor heating up quickly to operating temperature, at which point heat can (only) then be taken away from the construction via the PCM, since the PCM is engineered so as to have its phase change temperature coincide with the optimum operating temperature of the semiconductor. Altering this environment, so that heat is dissipated by the cooling fins and, if no more heat is generated than can be dissipated by the cooling fins the PCM is never used to absorb heat, totally undercuts this intent in the patent. Thus, one of ordinary skill in the art would not modify the disclosure in this manner. Thus, the reference does not suggest the present claims under 35 U.S.C. §103.

Rejections Under 35 U.S.C. §103

Claim 5 has been rejected under 35 U.S.C. §103 over Laing taken with Buckley '482. Moreover, claims 10-13 have been rejected under 35 U.S.C. §103 over Laing taken with Bunyan '198. Reconsideration of each of these rejections is respectfully requested.

Each of the secondary references cited in order to provide various additional disclosures such as the use of a solid phase change material or the use of an electronic component which is a computer CPU or memory chip. However, the considerable deficiencies of Laing are discussed above, and

neither of these secondary references remedies these deficiencies. For example, Bunyan discloses the use of a phase change material (col. 4, lines 42-43) used as an interlayer between the heat transfer surface of the component and a thermal dissipation member such as cooling fins. See col. 5, lines 43-49 and Fig. 1. Similarly, Buckley discloses the use of phase change material sandwiched in composite material used as clothing. Since the material is employed as clothing, patentees teach an exterior layer which is thermally insulating to reduce heat exchange between the PCM and the environment. See col. 4, lines 41-45. Patentees prefer a thermally conductive pathway between the PCM and the skin of the wearer, see col. 4, lines 64-end. Thus, this patent also fails to teach a configuration such as that presently claimed. Accordingly, withdrawal of all rejections under 35 U.S.C. §103 is respectfully requested.

The claims of the application is submitted to be in condition for allowance. However, if the Examiner has any comments or questions, he or she is cordially invited to telephone the undersigned at the number indicated below.

No fee is believed to be due with this response, however, the Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,



Harry B. Shubin, Reg. No. 32,004
Attorney/Agent for Applicant(s)

MILLEN, WHITE, ZELANO & BRANIGAN, P.C.
2200 Clarendon Boulevard, Suite 1400
Arlington, Virginia 22201
Telephone: (703) 243-6333
Facsimile: (703) 243-6410

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